REMARKS

Please reconsider the application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering this application and for allowing claims 40-52 and indicating that claims 16-18, 29-32, and 35 contain allowable subject matter.

Disposition of Claims

Claims 1-53 are pending in this application. Claims 1, 25, 33, 36-40, and 52-53 are independent. The remaining claims depend, directly or indirectly, from claims 1, 25, 33, and 40.

Rejections under 35 U.S.C. § 102

Claims 1 and 19-20 stand rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,671,863 ("Gauthier"). For the following reasons, this rejection is respectfully traversed.

One or more embodiments disclosed in this application are directed to a method and apparatus for estimating jitter of an electronic device by obtaining the jitter transfer function of the electronic device. It is known to one skilled in the art that the jitter transferring function of a device is defined to be the ratio of the output signal jitter of the device to the input signal jitter of the device (*see* "ITU-T Recommendation G.958" attached herewith, page 13). The Applicant notes that the jitter transfer function of a device is a property that is different from the transfer function of the device in the viewpoint that the former is phase noise that may vary with circuit characteristics and environments, but the latter is a performance characteristic that is defined for the device. For instance, the transfer function of a divider can be defined as a certain

value (*i.e.*, 1/n), but the jitter transfer function of the divider needs to be measured because it may vary with the particular state of the divider and the signal and power environments where the divider is used.

In accordance with one embodiment shown in Figure 3, the jitter transfer function measuring apparatus **101** includes the timing jitter estimator **501**, which calculates an output timing jitter sequence indicating the output timing jitter of an output signal output from the DUT in response to an input signal to the DUT, and the jitter transfer function estimator **103**, which calculates the jitter transfer function of the DUT based on the output timing jitter sequence. As an example for obtaining an output timing jitter sequence, linear approximation may be employed as shown in Figures 11 - 20 and the accompanying text. According to one or more embodiments of the present application, the jitter value of a DUT can be measured by modifying an output signal to a timing jitter sequence and obtaining the ratio of output jitter to input jitter.

Accordingly, independent claim 1 requires, in part, a timing jitter estimator operable to calculate *an output timing jitter sequence* of an output signal based on the output signal output from the electronic device; and a jitter transfer function estimator operable to calculate a *jitter transfer function* of the electronic device based on *the output timing jitter sequence*.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628 (see MPEP § 2131). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference" *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949 (see MPEP § 2112 IV). The Applicant respectfully asserts that Gauthier fail to show, either expressly or inherently, at least the above limitations of independent claim 1.

Gauthier relates to a method for simplifying the power supply noise model by using digitized power supply signals having noise. Specifically, Gauthier suggests a methodology for reducing output jitter by adjusting loop bandwidth. For instance, a PLL is simulated using a power supply model to find how output clock jitter depends upon power supply noise, and loop bandwidth is adjusted so that the output clock jitter can be minimized (*see* Figures 6-8 and the accompanying text).

However, Gauthier only mentions about the relationships between output clock jitter and power supply noise, but does not suggest any specific method to obtain the jitter characteristic of the PLL. That is, there can be many ways for measuring the jitter characteristic of a circuit, but Gauthier does not suggest any particular method for calculating a jitter value because its objective is only to propose a model for reducing somehow-obtained jitter values by changing loop bandwidth. Gauthier is completely silent as to an output jitter sequence and a jitter transfer function.

Further, it is noted that Figure 5B of Gauthier merely shows the transfer functions of the PLL circuit components in Laplace transform. As discussed earlier, the transfer function is different from the jitter transfer function because the transfer function is well-defined for each circuit component as can be seen in Figure 5B of Gauthier.

As such, Gauthier does not disclose at least a timing jitter estimator operable to calculate *an output timing jitter sequence* of an output signal based on the output signal output from the electronic device; and a jitter transfer function estimator operable to calculate a *jitter transfer function* of the electronic device based on *the output timing jitter sequence*, as required by claim 1. The Applicant notes that Gauthier does not *inherently* disclose these limitations because simulating the model shown in Gauthier does not necessarily or inevitably make a user practice the claimed invention.

In view of the above, Gauthier fails to show or suggest all limitations of independent claim 1. Thus, claim 1 is patentable over Gauthier. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 25-26, and 37

Claims 25-26 and 37 stand rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,835,501 ("Dalmia"). For the reasons set forth below, this rejection is respectfully traversed.

Independent claims 25 and 37 require, in part, estimating the bit error rate of the electronic device based on a gain of jitter transfer function of the electronic device. Claims 25 and 37 suggest estimating a bit error rate of a DUT, based on a jitter transfer function obtained with respect to the DUT.

Dalmia discloses a bit error rate tester (BERT). The BERT of Dalmia merely shows conventional BERTs, which measure a bit error rate by way of comparing measured input data with expected data. Also, Dalrnia shows measuring a bit error rate or jitter tolerance by using a clock signal having a known amount of jitter, and further shows that the amount of the jitter applied to the clock signal is estimated by calculating the gain of the VCO. However, as explained above, the jitter transfer function is defined as the ratio of output jitter to input jitter, and Dalmia is silent as to the ratio of input and output jitter. Therefore, Dalmia does not show at least estimating the bit error rate of the electronic device based on a gain of a *jitter transfer function* of the electronic device, as required by independent claims 25 and 37.

In view of the above, Dalmia fails to show or suggest all limitations of claims 25 and 37. Thus, claims 25 and 37, and claim 26 which depends from claim 25, are patentable over Dalmia. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 27-28, and 38

Claims 27-28 and 38 stand rejected under 35 U.S.C. 102(e) as being anticipated by Dalmia. For the reasons set forth below, this rejection is respectfully traversed.

Independent claims 27 and 38 require, in part, estimating the jitter tolerance of said electronic device based on a gain of a jitter transfer function of said electronic device. Claims 27 and 38 suggest estimating a jitter tolerance of a DUT, based on a jitter transfer function obtained with respect to the DUT.

As discussed above, Dalmia merely discloses conventional BERTs, which measure a bit error rate by way of comparing measured input data with expected data. Thus, Dalmia fails to teach or suggest estimating the jitter tolerance of the electronic device based on a gain of a *jitter transfer function* of the electronic device, as required by independent claims 27 and 38.

In view of the above, Dalmia fails to show or suggest all limitations of claims 27 and 38. Thus, claims 27 and 38, and claim 28 which depends from claim 27, are patentable over Dalmia and Walker. Accordingly, withdrawal of this rejection is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 2-3

Claims 2-3 stand rejected under 35 U.S.C. 103(a) as being obvious over Gauthier in view of U.S. Patent No. 6,573,940 ("Yang"). For the following reasons, this rejection is respectfully traversed.

As discussed above, Gauthier fails to show or suggest at least a timing jitter estimator operable to calculate *an output timing jitter sequence* of an output signal based on the output signal output from the electronic device; and a jitter transfer function estimator operable to calculate a *jitter transfer function* of the electronic device based on *the output timing jitter sequence*, which is also required by claims 2-3. Further, Yang does not teach that which Gauthier lacks. Specifically, Yang is only relied upon for teaching an instantaneous phase noise estimator and re-sampler. However, like Gauthier, Yang is silent with respect to at least the timing jitter estimator and the jitter transfer function estimator.

In view of the above, Gauthier and Yang, whether considered separately or in combination, fail to show or suggest all limitations of claims 2 and 3. Thus, claims 2 and 3 are patentable over Gauthier and Yang. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 4-15, 21-24, and 36

Claims 4-15, 21-24, and 36 stand rejected under 35 U.S.C. 103(a) as being obvious over Gauthier in view of U.S. Patent No. 6,782,404 ("Choudhary"). For the reasons set forth below, this rejection is respectfully traversed.

Claims 4-15 and 21-24 depend, either directly or indirectly, from independent claim 1. Independent claim 36 requires, in part, calculating an output timing jitter sequence, which indicates a plurality of output timing jitter of an output signal, based on said output signal output from said electronic device, and calculating a *jitter transfer function* of said electronic device based on *the output timing jitter sequence*.

As discussed above, Gauthier fails to show or suggest at least calculating an output timing jitter sequence of an output signal based on said output signal output from said electronic device, and calculating a *jitter transfer function* of said electronic device based on *the output timing jitter sequence*. Further, Choudhary does not teach that which Gauthier lacks. Specifically, Choudhary is only relied upon for teaching a plurality of input signals having different jitter amounts. However, like Gauthier, Choudhary is silent with respect to at least calculating an output timing jitter sequence of an output signal based on said output signal output from said electronic device, and calculating a *jitter transfer function* of said electronic device based on *the output timing jitter sequence*.

In view of the above, Gauthier and Choudhary, whether considered separately or in combination, fail to show or suggest all limitations of claims 4-15, 21-24, and 36. Thus, claims 4-15, 21-24, and 36 are patentable over Gauthier and Choudhary. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 53

Claims 53 stands rejected under 35 U.S.C. 103(a) as being obvious over Gauthier in view of U.S. Patent Application Publication No. 2003/0063701 ("Eubanks"). For the reasons set forth below, this rejection is respectfully traversed.

Independent claim 53 requires, in part, a jitter transfer function measuring apparatus operable to measure a *jitter transfer function* in said electronic device based on said output instantaneous phase noise.

As discussed above, Gauthier fails to show or suggest at least a jitter transfer function measuring apparatus operable to measure a *jitter transfer function* in said electronic device, which is required by claim 53. Further, Eubanks does not teach that which Gauthier lacks. Specifically, Eubanks is only relied upon for teaching estimating an output instantaneous phase noise. However, like Gauthier, Eubanks is silent with respect to at least a jitter transfer function measuring apparatus operable to measure a *jitter transfer function* in said electronic device.

In view of the above, Gauthier and Eubanks, whether considered separately or in combination, fail to show or suggest all limitations of independent claim 53. Thus, claim 53 is patentable over Gauthier and Eubanks. Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591, Reference No. 02008/092002.

Dated: March 20, 2008

Respectfully submitted,

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Attachments